

67108-040; Sung 2

REMARKS

Reconsideration and allowance are respectfully requested. Claims 1-22 are currently pending and stand rejected. Applicant has amended claims 1, 9, and 15. No new matter has been added.

Formal issues

The Office Action objected to the specification because of various informalities. Applicant has amended the specification according to the helpful suggestions from the Examiner. Withdrawal of the objection to the specification is respectfully requested.

§ 102 rejection

Claims 1-15 were rejected under 35 U.S.C. § 102(b) as being anticipated by EP 0 898 379 to Nakano ("Nakano"). Applicant respectfully traverses this rejection.

The Office Action asserted that Nakano teaches receiving a communications signal, estimating a Doppler change in frequency using a common pilot channel and removing the Doppler change in frequency of the communications signal within a dedicated physical channel using the estimated Doppler change in frequency. Applicant respectfully traverses this rejection.

The claims recite estimating the Doppler change in frequency of the communications signal using the common pilot channel and removing the Doppler change in frequency of the same communications signal in the dedicated physical channel. Instead, Nakano teaches estimating the Doppler shift amount of each multiple wave of despread pilot signals, passing only the frequency components of the estimated Doppler shift of the despread pilot signals through a filter, and using those pilot signals to correct the phase shift of the despread data signals. Nakano assumes that pilot signals sampled and estimated at a first point in time can be applied to subsequent data signals (see, e.g., paragraphs 37-45 and 75-85).

In other words, Nakano simply assumes that a channel estimate at a given time will be applicable to later received signals and does not even attempt to estimate a Doppler change in

67108-040; Sung 2

frequency using a common pilot channel and removing the Doppler change in frequency from a dedicated physical channel in the same signal used for the estimate.

Independent claim 1, by contrast, recites receiving a communications signal, estimating the Doppler change in frequency and removing the Doppler change in frequency of the same received communications signal. Similarly, claim 15 recites a pilot channel that estimates the Doppler change in frequency in the communications signal and a data channel rake section that receives the same communications signal, which contains data having the frequency error. Because Nakano corrects a phase shift of despread data signals using pilot signals from a previous communications signal passed through the filtering section 403, Nakano fails to anticipate the claimed invention. Withdrawal of the rejection is respectfully requested.

§ 103 rejection

Claims 16-22 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Nakano in view of U.S. Patent No. 6,363,102 to Ling et al. ("Ling"). Applicant respectfully traverses this rejection.

The Office Action admitted that Nakano fails to teach that each I and Q channel comprises a delay circuit, but asserted that "it would have been obvious. . . to modify Nakano's CDMA wireless communication apparatus in view of Ling's disclosure in order to reduce the computational effort required to compensate for a frequency offset in the data channel" (p. 6). Applicant respectfully disagrees.

Contrary to the Office Action's assertion, the proposed combination does not show I and Q estimation channels in a pilot channel rake section and I and Q data channels in a data channel rake section like the claimed invention. Although Ling does generally a despread to separate I and Q components, there is no motivation to modify Nakano to incorporate pilot and data channel rake sections with the I and Q estimation channels and I and Q data channels, respectively. Ling is quite specific regarding the way the pilot samples are processed with respect to frequency (see, e.g., col. 5, line 41 to col. 6, line 7, line 22), making it incompatible with the streamlined filtering section 403 taught in Nakano. Rather than reducing computational

67108-040; Sung 2

effort, as alleged by the Office Action, incorporating the teachings of Ling into Nakano would actually make computations much more complicated and undesirable.

"The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of such a combination>" MPEP § 2143.01. Nothing in neither Nakano, Ling, or the prior art in general suggests the desirability of incorporating the more complicated computational structure of Ling into the more streamlined structure of Nakano.

Moreover, like Nakano, Ling fails to show a structure that estimates a Doppler change in frequency using the common pilot channel and removing the Doppler change in frequency from the dedicated physical signal in the same communications signal as the common pilot channel. Instead, D1 teaches constructing a channel estimate, which is used to compensate for a Doppler effect (page 4, lines 22-28), from rotated pilot samples and then applying a phase rotation calculated at a first point in time to other pilot samples obtained at a later point in time (col. 8, lines 29-40). In other words, Ling clearly teaches applying the phase rotation to pilot samples other than the pilot samples used to calculate the channel estimate (i.e., pilot samples from a different signal). Thus, there is no reason for a given channel estimate to be applied to data from the same signal containing the pilot samples used to generate the channel estimate like the claimed invention.

Thus, the Office Action fails to establish a *prima facie* case of obviousness with respect to claims 16-22, and withdrawal of the rejection is respectfully requested.

All objections and rejections having been addressed, it is respectfully submitted that the present application is in condition for allowance, and a Notice to that effect is earnestly solicited. Applicant believes that no additional fees are necessary, however, the Commissioner is authorized

67108-040; Sung 2

to charge Deposit Account No. 50-1482 in the name of Carlson, Gaskey & Olds for any additional fees or credit the account for any overpayment.

Respectfully submitted,



Anna M. Shih, Reg. No. 36,372
Carlson, Gaskey & Olds
400 W. Maple Road, Ste. 350
Birmingham, MI 48009
(248) 988-8360

Dated: 3 November 2004

CERTIFICATE OF FACSIMILE

I hereby certify that this correspondence is being facsimile transmitted to the United States Patent and Trademark Office, (703) 872-9306, on November 3, 2004.



Beth A Beard